



ORIGINAL

#9 Appeal  
Brief  
4/8/04  
K. P. Hall

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Ming C. HAO et al.	§	Confirmation No.:	7017
Serial No.:	09/982,481	§	Group Art Unit:	2672
Filed:	10/17/2001	§	Examiner:	J. C. Wang
For:	A Method For Placement Of Data For Visualization Of Multidimensional Data Sets Using Multiple Pixel Bar Charts	§ § § § § § §	Docket No.:	10014772-1

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**APPEAL BRIEF**

**Mail Stop Appeal Brief – Patents**  
Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Date: April 1, 2004

Sir:

Appellant hereby submits this Appeal Brief in connection with the above-identified application. A Notice of Appeal was filed on February 3, 2004.

**I. REAL PARTY IN INTEREST**

The real party in interest is the Hewlett-Packard Company through its merger with Compaq Computer Corporation which owned Compaq Information Technologies Group, L.P. (CITG).

**II. RELATED APPEALS AND INTERFERENCES**

Appellant is unaware of any related appeals or interferences.

**III. STATUS OF THE CLAIMS**

Originally filed claims: 1-30.  
Claim cancellations: None.  
Added claims: 31 and 32.  
Presently pending claims: 1-32.  
Presently appealed claims: 1-32.

**IV. STATUS OF THE AMENDMENTS**

Applicants did not file any amendments after the final rejection.

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## V. SUMMARY

As explained in Applicants' Background section, pixel-oriented techniques present data directly rather than aggregating the data into a few data values. Pixel-based charts represent each item by a single pixel. See page 1, lines 10-15. Various problems exist with such techniques. For example, the visualization of complex data is cumbersome using pixel-based charts when analyzing large volumes. Page 1, lines 17-18. Further, some techniques do not offer optimal arrangement of data and/or do not arrange data logically. Page 2, lines 4-5 and 14-15.

Applicants contribution relates to a new and non-obvious method for placement of data for visualization of multidimensional data sets using pixel bar charts. Page 4, lines 2-3. In one disclosed embodiment, a pixel bar chart is used to display data in which each and every pixel in the chart is used to represent a separate record. The size of the chart is computed so as to ensure that each pixel in the chart has an associated record.

Figures 3b and 5 are illustrative of the disclosed subject matter. Figure 3b illustrates a graphically displayable array 320. The exemplary array 320 comprises three groups 306 and one or more sub-groups 308 within each group 306. The array 320 further comprises a horizontal axis 302 and a vertical axis 304. The array 320 comprises a plurality of data points (e.g., pixels). Records from a database divided among the various groups 306 according to a first dividing attributed. Within each group 306, the records are further divided among the various subgroup 308 according to a second dividing attribute. As can be seen in the exemplary array of Figure 3b, the various groups 306 are shown as columns that may have widths

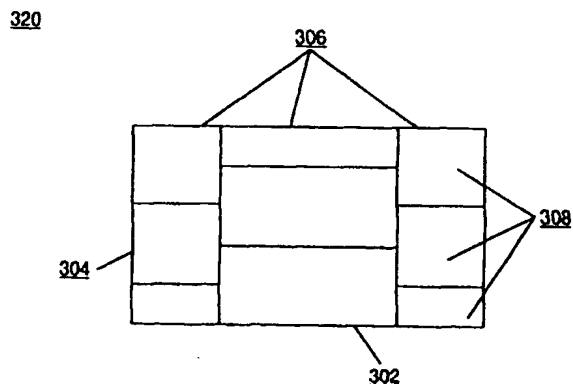


Figure 3b

that vary from column to column. For example, of the three columns in Figure 3b, the center column is wider than the other two columns. Varying the width of the columns permits each and every data point (pixel) to be assigned to a record. Page 13, line 21 through page 14, line 8.

Figure 5 further illustrates the use of all data points (pixels) within the displayable array. Figure 5 illustrates one of the sub-groups that may be used in a displayable array. Page 19, lines 8-18, explains that:

Figure 5 is an illustration of an exemplary sub-group 500 in accordance with one embodiment of the present invention.... Sub-group 500 comprises a plurality of pixels. In one embodiment, the plurality of pixels are pixels of a display screen (e.g., a computer monitor).

Lower-pixel 502 (e.g., position (1,1)) is placed first according to step 420 of process 400 (Figure 4). Lower pixel row 504 (e.g., position (i,1)) and left pixel row 506 (e.g., position (1,i)) are placed next, according to step 40 of process 400. Remaining pixels 508 (e.g., position (i+1,i+1)) are then placed in sub-group 500, according to step 440 of process 400.

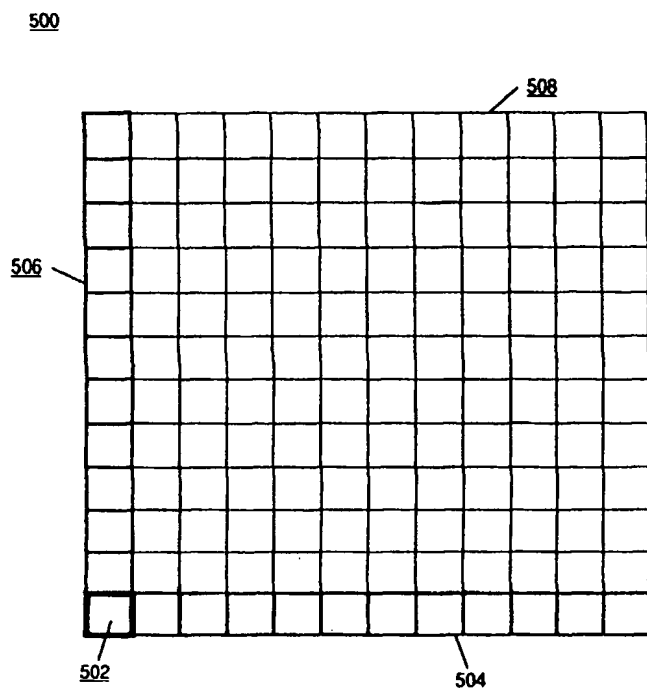


Figure 5

In this manner, each and every pixel in the displayable array is rendered with an attribute associated with a record.

Claims 1 and 31 are discussed in the arguments below and are reproduced below for convenience.

1. A method for arranging data, said method comprising:  
receiving said data comprising a plurality of records, each said record having a plurality of attributes;  
determining a set of attributes selected from said plurality of attributes, said set of attributes for placement of said plurality of records in a graphically displayable array, said graphically displayable array comprising a plurality of adjacent data points, each said data point representing one record of said plurality of records;  
arranging said plurality of records to construct said graphically displayable array so that each of said adjacent data points is assigned a record.
  
31. A computer-readable medium having computer-readable program code embodied therein that is adapted to cause a computer to implement a method to form a pixel bar chart comprising a plurality of columns, each column having a plurality of pixels, the method comprising:  
determining a width of each of the columns, the width of some columns being different than the width of other columns;  
assigning records to every pixel in said columns; and  
applying a variable color to all of the pixels in all of the columns according to an attribute of said records.

**VI. ISSUE(S)**

1. Whether claims 1-30 are patentable under 35 U.S.C. § 102(b) over Tabei et al. (U.S. Pat. No. 5,929,863).
2. Whether claims 31-32 are patentable under 35 U.S.C. § 103(a) over Tabei et al. (U.S. Pat. No. 5,929,863).

**VII. GROUPING OF CLAIMS**

Claims 1-30 may be grouped together as well as claims 31-32. Applicant has selected claim 1 from the first group (claims 1-30) and claim 31 from the second group (claims 31-32) in the arguments below.

## VIII. ARGUMENT

### A. The Tabei Reference

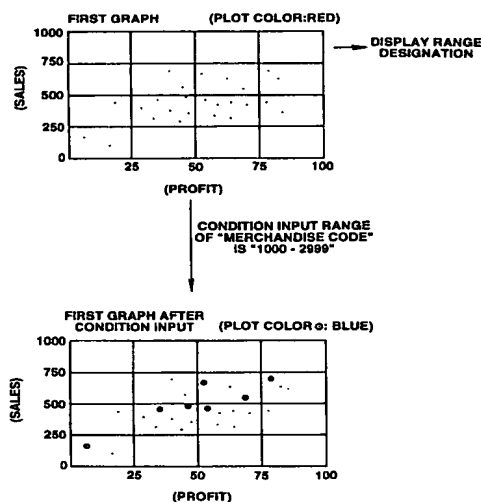
Tabei is directed to a record extraction method and apparatus in which a distribution graph is displayed on the basis of records retrieved from a database. The Abstract of Tabei is particularly informative of the nature of the invention disclosed therein:

In performing record retrieval processing, a record retrieval processor forms a two-dimensional distribution graph from a plurality of records stored in a record file on the basis of designated items on the x- and y-axes and displays the distribution graph on a display unit. When a retrieval range is designated on the displayed distribution graph, the record retrieval processor retrieves records within the designated range, reads out records on the basis of key codes of the retrieved records corresponding to the items, and displays the readout records on the display unit.

An exemplary graph produced by the invention of Tabei is shown in Figure 11 and reproduced below for convenience.

U.S. Patent Jul. 27, 1999 Sheet 10 of 11 5,929,863

FIG. 11



As can be seen, the graphs comprise an x-axis (profit) and a y-axis (sales) and various data points plotted in the graphs based on the x-y coordinates.

Also, as can be seen, much blank space exists between dots on the graphs of Figure 11.

**B. The Examiner Erred in Rejecting Claim 1 as Anticipated by Tabei.**

Claim 1 comprises, among other features, a "graphically displayable array comprising a plurality of adjacent data points" and "arranging said plurality of records to construct said graphically displayable array so that each of said adjacent data points is assigned a record." The claim term "data point" refers to the composition of the graphically displayable array. That is, the displayable array comprises adjacent data points. Further, each data point in the displayable array is assigned a record. Tabei does not teach or suggest a plurality of adjacent data points in which each adjacent data point is assigned a record. Tabei's Figure 11 (see above) shows various records plotted on a graph. The graph in Figure 11 comprises a plurality of adjacent data points (i.e., the sum total of all possible locations at which to plot a record), but not every possible data point in the graph is assigned a record. Many unassigned data points exist between the plotted records. Thus, Tabei does not anticipate nor even render obvious the invention of claim 1, and for at least this reason the Examiner erred in rejecting claim 1.

**C. The Examiner Erred in Rejecting Claim 31 as Obvious by Tabei.**

Claim 31 is directed to a computer-readable medium having code embodied therein that is adapted to cause a computer to perform a method. The claimed method comprises "determining a width of each of the columns, the width of some columns being different than the width of other columns; assigning records to every pixel in said columns; and applying a variable color to all of the pixels in all of the columns according to an attribute of said records." Tabei does not teach or suggest this combination of limitations. For instance, Tabei does not teach assigning records to every pixel in the columns of a pixel bar chart. At least for this reason, the Examiner erred in rejecting claim 31.

Claim 31 also requires that "the width of some columns being different than the width of other columns." The Examiner acknowledges that it is not clear whether Tabei discloses variable width columns. The Examiner indicates that Tabei suggests, however, variable width columns because Tabei discloses "determining a minimum and maximum values and item data ranges for the x-axis and y-axis wherein the item data ranges are variably selected (column 3)."


Applicants assume the Examiner is referring to the following passage from Tabei. "In forming the two-dimensional distribution graph..., the distribution graph formation item memory 6a stores an x-axis item, a y-axis item, an x-axis maximum value, and a y-axis maximum value as distribution graph formation basic data which is input as an input window (to be described later)." Column 3, lines 46-53. This passage is silent with regard to selecting minimum x-axis and y-axis values in contrast to the Examiner's assertion. Further, this passage does not at all state or even remotely suggest that the width of any column in the graph can be different from the width of any other column. For this additional reason, the Examiner erred in rejecting claim 31.

#### **IX. CONCLUSION**

For the reasons stated above, Applicants respectfully submit that the Examiner erred in rejecting all pending claims. If any fees or time extensions are inadvertently omitted or if any fees have been overpaid, please appropriately charge or credit those fees to Hewlett-Packard Company Deposit Account Number 08-2025 and enter any time extension(s) necessary to prevent this case from being abandoned.

Respectfully submitted,

HEWLETT-PACKARD COMPANY  
Intellectual Property Administration  
Legal Dept., M/S 35  
P.O. Box 272400  
Fort Collins, CO 80527-2400

  
Jonathan M. Harris, Reg. No. 44,144  
CONLEY ROSE, P.C.  
(713) 238-8000 (Phone)  
(713) 238-8008 (Fax)  
ATTORNEY FOR APPLICANTS

**APPENDIX TO APPEAL BRIEF**  
**CURRENT CLAIMS**

1. (Previously presented) A method for arranging data, said method comprising:
  - receiving said data comprising a plurality of records, each said record having a plurality of attributes;
  - determining a set of attributes selected from said plurality of attributes, said set of attributes for placement of said plurality of records in a graphically displayable array, said graphically displayable array comprising a plurality of adjacent data points, each said data point representing one record of said plurality of records;
  - arranging said plurality of records to construct said graphically displayable array so that each of said adjacent data points is assigned a record.
2. (Original) A method as recited in Claim 1 wherein said set of attributes comprises:
  - at least one dividing attribute,
  - a first ordering attribute corresponding to a first axis,
  - a second ordering attribute corresponding to a second axis, and
  - a visual indicator attribute corresponding to a visual indicator.
3. (Previously presented) A method as recited in Claim 2 wherein arranging said plurality of records comprises sorting said plurality of records by a first dividing attribute, said first dividing attribute corresponding to said first axis, and partitioning said plurality of records into groups according to said first dividing attribute;
4. (Previously presented) A method as recited in Claim 3 wherein arranging said plurality of records further comprises:
  - sorting said records of each said group according to said first ordering attribute and said second ordering attribute; and



applying said visual indicator to each of said plurality of records according to said visual indicator attribute.

5. (Previously presented) A method as recited in Claim 3 wherein arranging said plurality of records further comprises:

sorting said records of each of said groups according to a second dividing attribute, said second dividing attribute corresponding to said second axis, and partitioning said records of each of said groups into sub-groups according to said second dividing attribute;

sorting said records of each said sub-group according to said first ordering attribute and said second ordering attribute; and

applying said visual indicator to each of said plurality of records according to said visual indicator attribute.

6. (Original) A method as recited in Claim 1 wherein each said data point is represented by a pixel on a display.

7. (Original) A method as recited in Claim 2 wherein said first axis is a horizontal axis.

8. (Original) A method as recited in Claim 2 wherein said second axis is a vertical axis.

9. (Original) A method as recited in Claim 2 wherein said visual indicator is a color.

10. (Original) A method as recited in Claim 1 wherein said graphically displayable array is a pixel bar chart.

11. (Previously presented) A computer system comprising:  
a bus;

a display device coupled to said bus;  
a computer-readable memory coupled to said bus; and  
a processor coupled to said bus, said processor for executing a method for  
arranging data, said method comprising:  
receiving said data comprising a plurality of records, each said  
record having a plurality of attributes;  
determining a set of attributes selected from said plurality of  
attributes, said set of attributes for placement of said plurality  
of records in a graphically displayable array, said graphically  
displayable array comprising a plurality of adjacent data  
points, each said data point representing one record of said  
plurality of records;  
arranging said plurality of records to construct said graphically  
displayable array so that each of said adjacent data points is  
assigned a record.

12. (Original) A computer system as recited in Claim 11 wherein said set of attributes comprises:

at least one dividing attribute,  
a first ordering attribute corresponding to a first axis,  
a second ordering attribute corresponding to a second axis, and  
a visual indicator attribute corresponding to a visual indicator.

13. (Previously presented) A computer system as recited in Claim 12 wherein arranging said plurality of records comprises sorting said plurality of records by a first dividing attribute, said first dividing attribute corresponding to said first axis, and partitioning said plurality of records into groups according to said first dividing attribute.

14. (Previously presented) A computer system as recited in Claim 13 wherein arranging said plurality of records further comprises:

sorting said records of each said group according to said first ordering attribute and said second ordering attribute; and  
applying said visual indicator to each of said plurality of records according to said visual indicator attribute;

15. (Previously presented) A computer system as recited in Claim 13 wherein arranging said plurality of records further comprises:

sorting said records of each of said groups according to a second dividing attribute, said second dividing attribute corresponding to said second axis, and partitioning said records of each of said groups into sub-groups according to said second dividing attribute;  
sorting said records of each said sub-group according to said first ordering attribute and said second ordering attribute; and  
applying said visual indicator to each of said plurality of records according to said visual indicator attribute.

16. (Original) A computer system as recited in Claim 11 wherein each said data point is represented by a pixel on a display.

17. (Original) A computer system as recited in Claim 12 wherein said first axis is a horizontal axis.

18. (Original) A computer system as recited in Claim 12 wherein said second axis is a vertical axis.

19. (Original) A computer system as recited in Claim 12 wherein said visual indicator is a color.

20. (Original) A computer system as recited in Claim 11 wherein said graphically displayable array is a pixel bar chart.

21. (Previously presented) A computer-readable medium having computer-readable program code embodied therein for causing a computer system to perform a method for arranging data, said method comprising:

receiving said data comprising a plurality of records, each said record having a plurality of attributes;

determining a set of attributes selected from said plurality of attributes, said set of attributes for placement of said plurality of records in a graphically displayable array, said graphically displayable array comprising a plurality of adjacent data points, each said data point representing one record of said plurality of records;

arranging said plurality of records to construct said graphically displayable array so that each of said adjacent data points is assigned a record.

22. (Original) A computer-readable medium as recited in Claim 21 wherein said set of attributes comprises:

at least one dividing attribute,

a first ordering attribute corresponding to a first axis,

a second ordering attribute corresponding to a second axis, and

a visual indicator attribute corresponding to a visual indicator.

23. (Previously presented) A computer-readable medium as recited in Claim 22 wherein arranging said plurality of records comprises sorting said plurality of records by a first dividing attribute, said first dividing attribute corresponding to said first axis, and partitioning said plurality of records into groups according to said first dividing attribute.

24. (Previously presented) A computer-readable medium as recited in Claim 23 wherein arranging said plurality of records further comprises:

sorting said records of each said group according to said first ordering attribute and said second ordering attribute; and

applying said visual indicator to each of said plurality of records according to said visual indicator attribute.

25. A computer-readable medium as recited in Claim 23 wherein arranging said plurality of records further comprises:

sorting said records of each of said groups according to a second dividing attribute, said second dividing attribute corresponding to said second axis, and partitioning said records of each of said groups into sub-groups according to said second dividing attribute;

sorting said records of each said sub-group according to said first ordering attribute and said second ordering attribute; and

applying said visual indicator to each of said plurality of records according to said visual indicator attribute.

26. (Original) A computer-readable medium as recited in Claim 21 wherein each said data point is represented by a pixel on a display.

27. (Original) A computer-readable medium as recited in Claim 22 wherein said first axis is a horizontal axis.

28. (Original) A computer-readable medium as recited in Claim 22 wherein said second axis is a vertical axis.

29. (Original) A computer-readable medium as recited in Claim 22 wherein said visual indicator is a color.

30. (Original) A computer-readable medium as recited in Claim 21 wherein said graphically displayable array is a pixel bar chart.

31. (Previously presented) A computer-readable medium having computer-readable program code embodied therein that is adapted to cause a computer to

implement a method to form a pixel bar chart comprising a plurality of columns, each column having a plurality of pixels, the method comprising:

- determining a width of each of the columns, the width of some columns being different than the width of other columns;
- assigning records to every pixel in said columns; and
- applying a variable color to all of the pixels in all of the columns according to an attribute of said records.

32. (Previously presented) The computer-readable medium of claim 31 wherein said method further comprises:

- forming a plurality of pixel bar charts, each cart comprising a plurality of variable width columns, each column containing a variable number of pixels;
- assigning a record to a commonly located pixel in each chart; and
- applying a variable color to the pixels in each chart according to an attribute of said records, said attribute being different among the charts.



**ORIGINAL**

IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

ATTORNEY DOCKET NO. 10014772-1 *2700*

*AF/2577*  
*\$*

Inventor(s): Ming C. HAO et al.

Confirmation No.: 7017

Application No.: 09/982,481

Examiner: J. C. Wang

Filing Date: 10/17/2001

Group Art Unit: 2672

Title: A METHOD FOR PLACEMENT OF DATA FOR VISUALIZATION OF MULTIDIMENSIONAL DATA SETS USING MULTIPLE PIXEL BAR CHARTS

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Commissioner For Patents  
PO Box 1450  
Alexandria, VA 22313-1450

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TRANSMITTAL OF APPEAL BRIEF

Technology Center 2600

Sir:

Transmitted herewith in **triplicate** is the Appeal Brief in this application with respect to the Notice of Appeal filed on 02/03/2004.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$330.00.

**(complete (a) or (b) as applicable)**

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( ) one month	\$110.00
( ) two months	\$420.00
( ) three months	\$950.00
( ) four months	\$1480.00

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of \$330.00. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

(X) I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to:  
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22313-1450. Date of Deposit: 04/01/2004  
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Number of pages:

Typed Name: Christina L. Paz

Signature: *Christina L. Paz*

Respectfully submitted,

Ming C. HAO et al.

By *[Signature]*

Jonathan M. Harris

Attorney/Agent for Applicant(s)

Reg. No. 44,144

Date: 04/01/2004

Telephone No.: (713) 238-8000